

Bio-Diversity of Leguminous plants of North West Rajasthan

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ABSTRACT

Leguminosae are the second largest family for this State, represented by 277 species belonging to 81 genera. Of these 54 spp. are trees, 60 spp. are shrubs, 145 spp. are herbs and 18 spp. are climbers / lianas/twiners. Within the family, Faboideae are the largest sub-family with 203 species belonging to 61 genera while Caesalpinioideae and Mimosoideae are represented by 41 species belongs 7 genera and 33 species belongs 8 genera respectively. Dominant genera are *Crotalaria* (22 spp.), *Desmodium* (10 spp.), *Indigofera* (22 spp.) and *Tephrosia* (13 spp.) of sub-family Faboideae, *Cassia* (12 spp.) of sub-family Caesalpinioideae and *Acacia* (16 spp.) of sub-family Mimosoideae.

Introduction

The state of Rajasthan, situated between 23⁰03' to 30⁰ 12' North latitudes and 69⁰ 30'to 78⁰17'East longitudes in the North-West part of Indian subcontinent. It has an area of 3,42,274 sq. Kms. approx. The floristic study of the State as a whole did not invite much attention of scientific workers for long. Publications prior to Hooker's flora of British India (1872 – 97), do not include any information of plants from this State. An attempt for the first time, however, has been made in 1987 by the Botanical Survey of India by publishing one volume of **Flora of Rajasthan**. Sharma and Sharma's (1989) **Flora of Rajasthan - Series Inferae** is another welcome contribution. The earlier published ones, although for a portion of the State, are: Blatter and Hallberg's (1918 -21) on Indian Desert, (later revised, enlarged and up-to-dated by Bhandari, 1978 and further revised by him in 1990); Puri et al. (1964) on **Flora of Rajasthan – West of Arawallis**; Sharma and Tyagi's (1979) **Flora of North - East Rajasthan**; besides two districts floras during 1983, viz., Shetty and Pandey, Singh for Tonk and Banswara districts respectively.

Materials and Methods

The leguminous plants have been enumerated here and the information about them has been

gathered during field trips in and around various regions of the State. Several persons were consulted for collecting most of the information, which has been supplemented with information obtained after thorough search of literature and examination of Herbarium sheets in RUBL (The Herbarium of Botany Department, University of Rajasthan, Jaipur) and various other herbaria housing sheets from Rajasthan.

Information about these plants has been tabulated in various tables showing appropriate columns. In the tables the sub-families have been arranged alphabetically, mentioning their various heads like number of species or genera, habit and habitats besides their dominance in the State.

During the course of present study, available literature on the flora of Rajasthan was consulted and a tentative list of plants was prepared. This study also resulted into name changes of several leguminous plants occurring in the State. The nomenclature of all the taxa has been up-to-date besides corrections of several misidentified sheets deposited in herbaria mentioned above. Illustrations of taxa which are not available in literature, published to-date, have been prepared. Presently conducted studies have resulted in the addition of five species to the State list of Fabaceae.

During perusal of literature, the National flora (Hooker's **Flora of British India**, 1872 -97); regional floras of adjacent areas (Cooke's **Flora of Presidency of Bombay**, 1901 – 08, Duhie's **Flora of Upper Gangetic Plains**, 1903 – 29); floras from adjoining areas viz., Maheshwari's **Flora of Delhi**, (1963), Nair's **Flora of the Punjab Plains**, (1978), Shah's **Flora of Gujrat**, (1978); State floras viz., Shetty and Singh's **Flora of Rajasthan** Vol. 1 (1987), Sharma and Sharma's **Flora of Rajasthan - Series Inferae** (1989); floras covering portions of the State viz., Bhandari's **Flora of Indian Desert**, (1978), Sharma and Tyagi's **Flora of North – East of Rajasthan**, (1979); district floras viz., Ramdeo, **Flora of Udaipur district**, (1969), Sharma's **Flora of Jaipur district**, (1974), Singh's **Flora of Banswara**, (1983), Shetty and Pandey's **Flora of Tonk district**, (1983) besides several thesis submitted for Ph. D. degree at Jaipur Centre viz., on : Jhalawar by Shringi, (1985), Jhunjhunu by Kulhari, (1988) etc. The revisionary studies of several taxa carried out in India or abroad have also been consulted.

Taxonomic History of Fabaceae in Rajasthan

Duthie's flora of Upper Gangetic Plains (1903 – 29) can be regarded as the first flora for the major portion of the State (Sharma, 1980), who enumerated 177 species belonging to 53 genera. Contributions of subsequent workers on flora of Rajasthan after the publication of

Duthie's flora have brought the number of species from 177 to 232, some of these are mentioned below:

S. No.	Name of worker	Area	In the year	Resulting into addition of number of species
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1	Blatter, E. & F. Hallberg	Indian Desert	1918	13
2	Sankhla, K. S.	Jodhpur	1951	1
3	Nair, N. C. & G. S. Nathawat	Jhunjhunu	1957	2
4	Sharma, V. S.	Ajmer	1958	1
5	Raizada, M. B.	Ajmer	1958	1
6	Nair, N. C.	Jhunjhunu	1961	2
7	Jain, S. K.	Mt. Abu	1962	1
8	Raizada, M. B. & V. S. Sharma	Ajmer	1962	1
9	Sharma, M. B.	Churu	1962	1
10	Puri, G. S., S. K. Jain, S. K. Mukherjee, N. N. Kotwal & S. Sarup	West of Arawallis	1964	2
11	Vyas, L. N.	Alwar	1967	1
12	Dhillon, K. B. S. & P. S. Bajwa	Ganganagar	1969	1
13	Ramdeo, K. D.	Udaipur	1969	2
14	Maheshwari, J.K. & V. S. Sharma	Ajmer	1969	1
15	Majumdar, R. B.	Jhunjhunu	1969	2
16	Majumdar, R. B.	Kota Divn.	1971	3
17	Singh, V.	Rajasthan	1976	2
18	Bhandari, M. M. & M. R. Mehta	Mt. Abu	1978	3
19	Bhandari, M. M.	Jodhpur	1978	1
20	Sharma, S. & B. Tyagi	North East Rajasthan	1979	4
21	Thothathari, K. & A. Pramanik	Rajasthan	1981	1

22	Singh, B. P. & K. B.S. Dhillon	Ganganagar	1989	4
Total				50

Discussion on Present Work Members of all the three sub-families viz., Caesalpinioideae, Faboideae (erstwhile Papiliontae or Papilionoideae) and Mimosoideae are represented in Rajasthan State. Jain (1970) reported the occurrence of 177 species belonging to 51 genera of Fabaceae from Rajasthan.

Shetty and Singh (1987), however, have enumerated 249 species belonging to 76 genera from this area in their Flora of Rajasthan. These figures at the sub-family level are 38 species (16 cultigens) of 12 genera; 181 species (21 cultigens) of 56 genera and 30 species (1 cultigen) of 8 genera of sub-families Caesalpinioideae, Faboideae and Mimosoideae respectively.

As a result of present studies, the above number rise to:

Sub-families	Number of Genera	Number of occurring species		Total
		Naturally	Cultigens	
Caesalpinioideae	12	025	016	041
Faboideae	61	177	026	203
Mimosoideae	08	030	003	033
Total	81	232	045	277

Classification of species: Data on the basis of their occurrence (natural or cultivated) and habit forms is tabulated below:

Sub-families	Number of species										Grand Total
	Trees		Shrubs		Herbs		Climbers		Total		
Caesalpinioideae											
Natural	8	-	9	-	6	-	2	-	25	-	041
Cultigens	-	8	-	8	-	X	-	X	-	16	
Faboideae											
Natural	16	-	35	-	115	-	11	-	177	-	203
Cultigens	-	2	-	2	-	20	-	2	-	26	
Mimosoideae											
Natural	17	-	6	-	4	-	3	-	30	-	033
Cultigens	-	3	-	X	-	X	-	X	-	3	
Total											
Natural	41	-	50	-	125	-	16	-	232	-	277
Cultigens	-	13	-	10	-	20	-	2	-	45	
Grand Total	054		060		145		018		277		

Hooker's flora of British India (1872 -1897) is regarded as the National flora of our country, but it needs up-to-dating of nomenclature besides several other additions. Information based on this work regarding leguminous species of Rajasthan and number of species where nomenclatural changes have taken place is given below:

Sub-families	No. of species mentioned from Rajasthan	No. of species requiring nomenclature change
Caesalpinioideae	029	09
Faboideae	173	67
Mimosoideae	028	08
Total	230	84

Conclusion

Species restricted to particular habitats:

The State of Rajasthan provides wide range of habitats viz., fields of cultivation, sandy plains, aquatic habitats and hilly terrains. Species restricted to these are:

S. No.	Habitats	No. of species
1	Sandy plains	50
2	Hilly	53
3	Aquatic	11
4	Cultivated fields (Weeds)	29

Species of common occurrence:

Frequently occurring leguminous species all over the State of Rajasthan, are tabulated below habit-wise and mentioning their number at sub-family level.

Sub-families	No. of species				Total No.
	Trees	Shrubs	Climbers	Herbs	
Caesalpinioideae	1	X	X	05	06
Faboideae	2	X	X	20	22
Mimosoideae	7	2	X	X	09
Total	10	2	X	25	37

Worth – mentioning of these 37 species are: 9 species of trees e.g. *Acacia leucophloea*, *A. nilotica* subsp. *indica*, *A. Senegal*, *Albizia lebbeck*, *Butea monosperma*, *Cassia fistula*, *Dalbergia sissoo*, *Dichrostachys cinerea* and *Prosopis cineraria*. The solitary shrub is *Acacia jacquemonti*. Herbaceous species are 11 in number viz., *Alysicarpus monilifer* var. *monilifer*, *Crotalaria burhia*, *Indigofera astragalina*, *I. linnaei*, *Lathyrus aphaca*, *Melilotus alba*, *M. indica*, *Tephrosia hamiltonii*, *Trigonella monantha* subsp. *incisa* and *T. occulta*.

Genera represented by more than 10 species are as under:

Name of taxa	No. of species				Total
	Trees	Shrubs	Climbers	Herbs	
Caesalpinioideae					
1. <i>Cassia</i>	2	4	X	6	12
Faboideae					
*2. <i>Crotalaria</i>	X	7	X	15	22
3. <i>Desmodium</i>	X	4	X	6	10
*4. <i>Indigofera</i>	X	9	X	13	22
5. <i>Tephrosia</i>	X	3	X	10	13
Mimosoideae					
#6. <i>Acacia</i>	9	4	3	X	16

*Genera with more than 20 species. # Genera with more than 15 species but under 20.

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